Sergei Treil

Professor,
Department of Mathematics,
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Education

1977–1982 **MSc, mathematics**, *Leningrad State University*.

1982–1985 **PhD, mathematics**, *Leningrad State University*,
Advisor: N. Nikolski, Thesis: "Geometric aspects of the theory of Hankel and Toeplitz operators".

Research interests:

Harmonic Analysis, Complex Analysis, and Operator Theory.

Positions held:

2001– . . . **Professor**, *Brown University, Department of Mathematics.*

2000–2001 **Associate Professor**, *Brown University, Department of Mathematics.*

Fall 1998 **Visiting Professor**, *MIT, Dept. of Electrical Engineering and Computer Science.*

1998–1999 **Professor**, *Michigan State University, Department of Mathematics.*

1994–1998 **Associate Professor**, *Michigan State University, Department of Mathematics.*

1992–1994 **Assistant Professor**, *Michigan State University, Department of Mathematics.*

1991–1992 **Visiting Assistant Professor**, *Michigan State University, Department of Mathematics.*

1989–1991 **Researcher**, *Leningrad University, Laboratory of Theoretical Cybernetics.*

1986–1989 **Assistant Professor**, *Branch of Moscow Aviation Institute (MAI) at Leninsk (Baikhonoor).*

Honors

1993 **Salem Prize**.

Grants:

2021–2024 **NSF grant DMS-2154321**, *Collaborative Research: Non-homogeneous Harmonic Analysis, Spectral Theory, and Weighted Norm Estimates*, (joint with F. Nazarov and A. Volberg).

2019–2021 **NSF grant DMS-1856719**, *Collaborative research: Weighted estimates with matrix weights and non-homogeneous harmonic analysis*, (joint with F. Nazarov and A. Volberg).

2016–2019 **NSF grant DMS-1600139**, *Collaborative Research: Calderon–Zygmund Operators in Highly Irregular Environment and Applications*, (joint with F. Nazarov and A. Volberg).

2013–2016 **NSF grant DMS-1301579**, *Collaborative Research: Universality phenomena and some hard problems of non-homogeneous Harmonic Analysis*, (joint with F. Nazarov and A. Volberg).

2008–2013 **NSF grant DMS-0800876**, *Collaborative Research: Bellman function, Harmonic Analysis and Operator Theory*, (joint with F. Nazarov and A. Volberg).

2005–2008 **NSF grant DMS-0501065**, *Collaborative research: Non-homogeneous harmonic analysis, two weight estimates and spectral problems.*, (joint with F. Nazarov and A. Volberg).

2002–2005 **NSF grant DMS-0200584**, *Collaborative Research: Multidimensional and Non-Homogeneous Harmonic Analysis: Bellman Functions, Perturbations of Normal Operators and Two Weight Estimates of Singular Integrals*, (joint with F. Nazarov and A. Volberg).

1999–2002 **NSF grant DMS-9970395**, *Calderon-Zygmund Operators in Non-Classical Situations: Weighted Norm Inequalities with Matrix Weights, Operators on Non-Homogeneous Spaces and Analytic Capacity*, (joint with F. Nazarov and A. Volberg).

1996–1999 **NSF grant DMS-9622936**, *An Operator Approach to Problems in Analysis and Probability: Matrix Muckenhoupt Weights, Hankel and Toeplitz Operators, Singular Integrals and the Angle between Past and Future*, (joint with A. Volberg).

1993–1996 **NSF grant DMS-9304011**, *Hankel Operators and Their Applications*, (joint with V. Peller).

Completed research and scholarship

Books, monographs.

[1] *Wiener – Hopf equations and their applications in problems of air-craft testing,* Moscow, MAI, 1989, 40 pp. (Russian).

[2] *Linear algebra done wrong,* (textbook for the Honors linear algebra course), available at `http://www.math.brown.edu/~treil/papers/LADW/LADW.html`.

Refereed journal articles: published and accepted

[1] *Geometric approach for the weighted norm inequalities for Hilbert transform,* Funktz. Anal. Prilozh., v. 17 (1985), No 4, 90 – 91 (Russian).

[2] *Operator approach for weighted norm inequalities for singular integrals,* Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 135 (1984), 150 –174 (Russian).

[3] *Moduli of Hankel operators and a problem of V.V.Peller – S.V.Khruschev,* Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 141 (1985), 39 – 55 (Russian).

[4] *Adamyan – Arov – Krein theorem: a vector version,* Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 141 (1985), 56 – 71 (Russian).

[5] *Moduli of Hankel operators and a problem of V.V.Peller – S.V.Khruschev*, Dokl. Akad. Nauk SSSR, v. 283 (1985), 1095 – 1099; (Russian) English translation: Soviet Math. Dokl., v.32 (1985), 293 – 297.

[6] *Inverse spectral problem for the modulus of a Hankel operator*, (with V.I. Vasyunin), LOMI Preprints, P-8-85, Leningrad, 1985 (Russian).

[7] *Vector version of Adamyan – Arov – Krein theorem,* Funktz. Anal. Prilozh., v. 20 (1986), No 1, 86 – 88 (Russian).

[8] *Extreme points of the unit ball of the operator Hardy space $H^\infty(E \to E)$,* Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 149 (1986), 160 – 164 (Russian).

[9] *A spatially compact system of eigenvectors forms a Riesz basis if it is uniformly minimal*, Dokl. Akad. Nauk SSSR, v. 288 (1986), 308 – 312; (Russian) English translation: Soviet Math. Dokl., v. **33** (1986), 675 – 679.

[10] *The invertibility of a Toeplitz operator does not imply its invertibility by the projection method*, Dokl. Akad. Nauk SSSR, v. 292 (1987); (Russian) English translation: Soviet Math. Dokl., v.35 (1987), 103 – 107.

[11] *Imbedding theorems for invariant subspaces of the backward shift,* (with A.L. Volberg), Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 149 (1986), 160 – 164 (Russian).

[12] *The resolvent of a Toeplitz operator may have an arbitrary grows*, Zap. Nauchn. Semin. Leningrad. Otdel. Mat. Inst. Steklov (LOMI), v. 157 (1989), 175 – 177 (Russian).

[13] *On error of the best prediction*, In: Mathematical problems in optimization and control of stochastic and deterministic systems, Moscow, MAI, 1988 (Russian)

[14] *Angles between coinvariant subspaces an operator corona problem (a Sz.-Nagy problem)*, Dokl. Akad. Nauk SSSR, v. 302 (1988), 1063–1068 (Russian); English translation: Soviet Math. Dokl., v.38 (1989), 394–399.

[15] *Inverse spectral problem for the modulus of a Hankel operator*, (with V.I. Vasyunin), Algebra i Analiz, v. 1 (1989), No 4, 54 – 67 (Russian).

[16] *Hankel operators, imbedding theorems, and bases of the invariant subspaces of the multiple shift*, Algebra i Analiz, v. 1 (1989), No 6, 200 – 234 (Russian, English translation).

[17] *Geometric methods in spectral theory of vector-valued functions; some recent results,* Operator theory, Adv. Appl., v. 42 (1989), 211 – 280.

[18] *Inverse problem for the modulus of a Hankel operator and balanced realizations*, Algebra i Analiz, v. 2 (1990), No 2, 158 – 182 (Russian).

[19] *The stable rank of the algebra H^∞ equals 1*, Journ. Funct. Anal., **109**(1992), 130–154.

[20] *The inverse spectral problem for selfadjoint Hankel operators,* (with A. Megretskii and V. Peller), Acta Mathematica, **174**(1995), 241–309.

[21] *A counterexample on continuous coprime factorizations*, IEEE Transactions of Automatic Control **39** (1994), 1262–1263.

[22] *Le probleme inverse pour les operateurs de Hankel autoajoints,* (with A. Megretskii and V. Peller), C. R. Acad Sci. Paris, **317**(1993), Serie I, 343–346.

[23] *A fixed point approach to the Nehari's theorem and its applications* (with A. Volberg), Operator Theory: Advances and Applications, **71** (1994) 165–186.

[24] *Superoptimal approximations by analytic and meromorphic functions*, Journal of Functional Analysis, **131**(1995), 386–414.

[25] *Power distribution inequalities in optimization and robustness of uncertain systems* (with A. Megretsky), Journ. of Math Systems, Estimation and Control, **3**(1993), No 3, 301–319

[26] *Superoptimal singular values and indices of infinite matrix functions* (with (V. Peller), Indiana University Math. Journal **44**(1995), 243–256.

[27] *Approximation by analytic matrix functions. The four block problem*, J. Funct. Anal. **148**(1997), No. 1, 191–228.

[28] *Wavelets and the angle between past and future,* (with A. Volberg), J. Funct. Anal. **143**(1997), no. 2, 269–308.

[29] *Weighted embeddings and weighted norm inequalities for Hilbert transform and maximal operator,* (with A. Volberg), St. Petersburg Mathematical Journal, **7** (1995), no. 6, 205–226

[30] *Unconditional bases of invariant subspaces of a contraction with finite defects*, Indiana University Math. Journal, **46** (1997), 1022–1054.

[31] *Hilbert transform, Toeplitz operators and Hankel operators, and invariant A_∞ weights*, (with A. Volberg and D. Zheng), Rev. Mat. Iberoamericana **13** (1997), no. 2, 319–360.

[32] *Continuous frame decomposition and a vector Hunt – Muckenhoupt – Wheeden Theorem*, (with A. Volberg), Arkiv för Matematik, **35**(1997), no. 2, 363–386.

[33] *The weighted norm inequalities for Hilbert transform are now trivial* (with F. Nazarov), C. R. Akad. Sci., Paris., **323**(1996), 717–722.

[34] *The hunt for the Bellman function: applications to estimates of singular integral operators and to other classical problems in harmonic analysis*, St. Petersburg Mathematical Journal, **8**(1996), No 5, 32–162.

[35] *A counterexample to infinitedimensional Carleson imbedding theorem* (with F. Nazarov and A. Volberg), C. R. Akad. Sci., Paris Sér. I Math., **235**(1997), No 4, 383–388.

[36] *The Bellman function and two weight inequalities for Haar multipliers*, (with F. Nazarov and A. Volberg), Journal of the American Mathematical Society, **12**(1999), No 4, 909–928.

[37] *Completely regular multivariate stationary processes and the Muckenhoupt condition*, (with A. Volberg), Pacific Journal of Mathematics, **190**(1999), No 2, 361–382.

[38] *Cauchy Integral and Calderón-Zygmund operators on nonhomogeneous spaces* (with F. Nazarov and A. Volberg), International Math. Research Notices, 1997, No 15, 103–726.

[39] *Weak type estimates and Cotlar inequalities for Calderón-Zygmund operators on nonhomogeneous spaces*, (with F. Nazarov and A. Volberg), International Math. Research Notices, **1998**, No 9, 463–487.

[40] *Linear resolvent growth of a weak contraction does not imply its similarity to a normal operator*, (with S. Kupin), Illinois Journal of Mathematics, **45** (2001), no. 1, 229–242.

[41] *A transference approach to estimates of vectorial Hankel operators* (with T. A. Gillespi, S. Pott, and A. Volberg), St. Petersburg Math. J., **12** (2001), No 6, 1013–1024.

[42] *The Bellman functions and sharp weighted inequalities for square functions.* (with S. Hukovic, and A. Volberg), Complex analysis, operators, and related topics, 97–113, Oper. Theory Adv. Appl., **113**, Birkhauser, Basel, 2000.

[43] *The gap between complex structured singular value μ and its upper bound is infinite*, preprint, 13pp, accepted by IEEE Transactions of Automatic Control

[44] *Linear resolvent growth of rank one perturbation of a unitary operator does not imply its similarity to a normal operator*, (with N. Nikolski), Journal d'Analyse Mathematique, **87** (2002), 415–431.

[45] *Estimates in the Corona Theorem and ideals of H^∞: a problem of T. Wolff*, Journal d'Analyse Mathematique, **87** (2002), 481–495.

[46] *Accretive system Tb theorems on nonhomogeneous spaces*, (with F. Nazarov and A. Volberg), Duke Math. J., **113** (2002), no. 2, 259–312.

[47] *Sharp estimates in vector Carleson imbedding theorem and for vector paraproducts*, (with F. Nazarov, G. Pisier and A. Volberg), 22 pp., Journal für die reine und angewandte Mathematik **542** (2002), 147–171.

[48] *An inverse spectral problem for Hankel operators.* (with R. A. Martínez–Avendaño), Journal of Operator Theory, **48** (2002), no. 1, 83–93.

[49] *Logarithmic growth for matrix martingale transform* (with A. Gillespie, F. Nazarov, S. Pott, and A. Volberg), J. London Math. Soc. (2), **64** (2001), no. 3, 624–636.

[50] *Bellman function in stochastic control and harmonic analysis*, (with F. Nazarov and A. Volberg) in: Systems, approximation, singular integral operators, and related topics (Bordeaux, 2000), 393–423, *Oper. Theory Adv. Appl., 129*, Birkhauser, Basel, 2001.

[51] *Why are the Riesz Transforms Averages of the Dyadic Shifts?* (with S. Petermichl and A. Volberg), Publ. Mat. , 2002 Proc of the 6th Intern. Conf. on Harm. Analysis, El Escorial, Spain.

[52] *The Tb-theorem on non-homogeneous spaces*, (with F. Nazarov and A. Volberg), Acta Mathematica, **190** (2003), 151-239.

[53] *Common Complements of Two Subspaces of a Hilbert Space*, (with M. Lauzon), Journal of Functional Analysis, **212** (2004), 500–512.

[54] *Lower bounds in the matrix corona theorem and the codimension one conjecture*, Geometric and Functional Analysis, **14** (2004), 1118–1133.

[55] *Very badly approximable matrix functions* (with V. Peller), Selecta Math. (N.S.) **11** (2005), no. 1, 127–154.

[56] *An operator Corona Theorem*, Indiana University Mathematical Journal, **53** (2004), No. 6, 1765-1784.

[57] *Logarithmic growth for weighted Hilbert transforms and vector Hankel operators*, (with A. Gillespie, S. Pott, and A. Volberg), Journal of operator Theory, **52** (2004), No 1, 103–112.

[58] *Approximation by analytic operator functions. Factorizations and very badly approximable functions.* (with V. Peller), Algebra i Analiz 17 (2005), no. 3, 160–183.

[59] *The matrix-valued H^p corona problem in the disk and polydisk* (with B. Wick) J. Funct. Anal. 226 (2005), no. 1, 138–172.

[60] *Very badly approximable matrix functions.* (with V. Pellr) Selecta Math. (N.S.) **11** (2005), no. 1, 127–154.

[61] *Scalar and vector Muckenhoupt weights* (with M. Lauzon), Indiana University Math. Journal, **56**(2007), No 4, 1989-2015.

[62] *Estimates in corona theorems for some subalgebras of H^∞*, (with A. Sassane), Arkiv för Matematik, **45**(2007), No 2, 351–380.

[63] *The problem of ideals: beyond the exponent* 3/2, Journal of Functional Analysis, **253** (2007), No 1, 220–240.

[64] *Carleson Potentials and the Reproducing Kernel Thesis for Embedding Theorems* (with S. Petermichl and B. Wick), Illinois Journal of Mathematics, **51**(2007), no. 4, 1249–1263.

[65] *Analytic projections, Corona Problem and geometry of holomorphic vector bundles* (with Brett Wick), arXiv:math/0702756v2 [math.CA], J. Amer. Math. Soc. **22** (2009), no. 1, 55–76.

[66] *Two weight estimate for the individual Haar multipliers and and other well localized operators.* (with F. Nazarov and A. Volberg), Mathematical Research Letters, **15**(2008), no. 3, 583–597.

[67] *A theorem about three quadratic forms*, (with O. Dragičević and A. Volberg), arXiv:0710.3249, IMRL, 2008, Art. ID rnn 072, 9 pp.

[68] *Similarity of operators and geometry of eigenvector bundles*, (with Hyun-Kyoung Kwon), arXiv:0712.0114, Publ. Mat. 53 (2009), no. 2, 417–438.

[69] H^1 *and dyadic* H^1, Amer. Math. Soc. Transl. Ser. 2, **226**, Amer. Math. Soc., Providence, RI, 2009; see also arXiv:0809.3288v1 [math.CA].

[70] *Rank one perturbations and singular integral operators* (with C. Liaw), arXiv:0810.2750v1 [math.FA], J. Funct. Anal. **257**(2009), no. 6, 1947–1975.

[71] *Curvature condition for non-contractions does not imply similarity to the backward shift* (with Hyun-Kyoung Kwon), arXiv:0903.4423v1 [math.CA], Integral Equations Operator Theory 66 (2010), no. 4, 529–538.

[72] *Weak-star convergence in multiparameter Hardy spaces* (with J. Pipher), arXiv:0909.2607v1 [math.CA], Proc. Amer. Math. Soc. **139** (2011), no. 4, 1445–1454.

[73] *Regularizations of general singular integral operators* (with C. Liaw), Revista Matemática Iberoamericana, **29**(2013), no. 1, 53–74.

[74] *Sharp weighted estimates for dyadic shifts and the* A_2 *conjecture*, (with T. Hytönen, C. Pérez nad A. Volberg), Journal für die reine und angewandte Mathematik (Crelle's Journal) **687** (2014), 43–86, see also arXiv:1010.0755v2 [math.CA].

[75] *Sharp* A_2 *estimates of Haar shifts via Bellman function,* In: recent trends in analysis, proceedings of the conference in honor of Nikolai Nikolski, Bordeaux, 2011; Theta Foundation, Bucharest, 2013; pp. 187–208: Se also arXiv:1105.2252v1 [math.CA].

[76] *Commutators, paraproducts and BMO in non-homogeneous martingale settings*, Revista Matemática Iberoamericana, **29** (2013), pp. 1325–1372.

[77] *Corona Solutions Depending Smoothly on Corona Data* (with B. Wick),
The corona problem, 201–209, Fields Inst. Commun., 72, Springer, New York, 2014, see also arXiv:1208.3410 [math.CA].

[78] *A Bellman function proof of the L^2 bump conjecture,* (with F. Nazarov, A.Reznikov, and A. Volberg), arXiv:1202.2406 [math.CA], 2012, 21 pp., J. Anal. Math. **121** (2013), 255–277.

[79] *Similarity of n-hypercontractions and backward Bergman shifts,* (with R. Douglas and H. Kwon), J. London Math. Soc. **88** (2013) No 3, pp. 637–648.

[80] *A remark on the reproducing kernel thesis for Hankel operators*, St. Petersburg Math. J., **26** (2015), no. 3, 479–485 , see also arXiv:1201.0063v1 [math.FA].

[81] *Clark model in general situation,* (with C. Liaw), Journal d'Analyse Mathmatique, 130 (2016), 287–328, see also arXiv:1308.3298 [math.FA].

[82] *A remark on two weight estimates for positive dyadic operators*, in: K. Gröchenig, Yu. Lyubarskii, K. Seip (Editors), *Operator-Related Function Theory and Time-Frequency Analysis: The Abel Symposium 2012 (Abel Symposia 9),* Springer, 2014, p. 185–195; see also arXiv:1201.1455v1 [math.CA], 9pp.

[83] *Weighted martingale multipliers in non-homogeneous setting and outer measure spaces* (with C. Thiele and A. Volberg), Advances in Mathematics, **285** (2015), 1155–1188; see also arXiv:1411.5345 [math.AP], 2014, 26 pp.

[84] *Singular integrals, rank one perturbations and Clark model in general situation* (with C. Liaw), In: Harmonic Analysis, Partial Differential Equations, Complex Analysis, Banach Spaces, and Operator Theory. Celebrating Cora Sadosky's life. Vol. 2, AWM–Springer Series, Springer; see also arXiv:1506.00072 [math.FA].

[85] *Entropy conditions in two weight inequalities for singular integral operators* (with A. Volberg), Adv. Math. **301** (2016), 499–548, see also arXiv:1408.0385 [math.CA].

[86] *Two weight L^p estimates for paraproducts in non-homogeneous settings* (with J. Lai), Journal of Functional Analysis, DOI: 10.1016/J.Jfa.2017.11.008, In Press; see also arXiv:1507.05570 [math.CA], 2015, 23 pp.

[87] *The Carleson Embedding Theorem with matrix weights* (with A. Culiuc), Int. Math. Res. Notes, DOI: 10.1093/Imrn/Rnx222; see also arXiv:1508.01716 [math.CA], 2015.

[88] *Two weight estimates with matrix measures for well localized operators* (with Kelly Bickel, Amalia Culiuc, and Brett D. Wick), Trans. Amer. Math. Soc., DOI: 10.1090/Tran/7400; see also arXiv:1611.06667 [math.FA], 2016, 27 pp.

[89] *Convex body domination and weighted estimates with matrix weights* (With F. Nazarov, S. Petermichl, A. Volberg), Adv. Math. **318** (2017), 279–306.

[90] *Mixed A_2-A_∞ estimates of the non-homogeneous vector square function with matrix weights*, arXiv:1705.08854 [math.CA], 8 pp., Proceedings of the American Mathematical Society, DOI: https://doi.org/10.1090/proc/14147.

[91] *On the failure of lower square function estimates in the non-homogeneous weighted setting* (with K. Domelevo, P. Ivanisvili, S. Petermichl, and A. Volberg), Mathematische Annalen, **374** (2019), no. 3–4, 1923–1952, see also arXiv:1705.08376 [math.AP], 26 pp.

[92] *Superexponential estimates and weighted lower bounds for the square function* (with P. Ivanisvili), Trans. Amer. Math. Soc. **372** (2019), no. 2, 1139–1157; see also arXiv:1711.07084 [math.AP].

[93] *General Clark model for finite-rank perturbations* (with C. Liaw), Analysis and PDE **12** (2019), no. 2, 449–492.

[94] *Matrix Measures and Finite Rank Perturbations of Self-adjoint Operators* (with C. Liaw), J. Spectr. Theory, **10** (2020), no. 4, 1173–1210; see also arXiv:1806.08856 [math.SP], 29 pp.

[95] *"Small step" remodeling and counterexamples for weighted estimates with arbitrarily "smooth" weights*, (with Spyridon Kakaroumpas), Adv. Math. 376 (2021), 107450, 52 pp.

[96] *Matrix-valued Aleksandrov-Clark measures and Carathéodory angular derivatives*, (with C. Liaw and R. T. W. Martin), J. Funct. Anal. 280 (2021), no. 3, 108830, 33 pp.

[97] *Dimension of the exceptional set in the Aronszajn–Donoghue theorem for finite rank perturbations* (with C. Liaw and A. Volberg), Int. Math. Res. Not. IMRN., 2022, no. 5, 3297–3307.

[98] *Preservation of absolutely continuous spectrum for contractive operators* (with C. Liaw), Algebra i Analiz, **34** (2022), no. 3, 232–251.

[99] *The matrix-weighted dyadic convex body maximal operator is not bounded* (with F. Nazarov, S. Petermichl, K. A. Škreb), Adv. Math. **410** (2022), part A, Paper No. 108711, 20 pp.

[100] *Commutators in the two scalar and matrix weighted setting* (with S. Pott and J. Isralowitz), J. Lond. Math. Soc. (2) **106** (2022), no. 1, 1–26.

Non-refereed journal articles, preprints, submitted papers:

[1] *Decentralized control. A criterion for the existing of stabilizing decentralized feedback*, Preprint Royal Institut of Technology, Dept. of Math, TRITA/MAT-90-0042, Stockholm, Sweden.

[2] *S-procedure and power distribution inequalities: a new method in optimization and robustness of uncertain systems*, (with A. Megretsky), Institut Mittag-Leffler Report No 1, 1990/91.

[3] *Nehari's theorem for weighted ℓ^2 spaces,* (with A. Volberg) Uppsala University Department of Mathematics report 1992:28.

[4] *On the uniqueness of best approximation by rational functions (Schur–Takagi problem),* preprint, 1994, 12pp.

[5] *A simple proof of the Hunt–Muckenhoupt–Wheeden theorem*, (with A. Volberg) Preprint, 1995, 1–7.

[6] *Calderón–Zygmund operators on non-homogeneous spaces and the Vitushkin conjecture*, (with F. Nazarov and A. Volberg), preprint, 1997, 60pp.

[7] *Two weight $T1$ theorems for the Hilbert transform: the case of doubling measures* (with F. Nazarov and A. Volberg), Preprint, 2004, pp. 1–40.

[8] *Two weight estimate for the Hilbert transform and corona decomposition for non doubling measures.* (with F. Nazarov and A. Volberg), Preprint, 2004, pp. 1–38.

[9] *On A_2 conjecture and corona decomposition of weights,* (with C. Perez and A. Volberg), arXiv:1003.1596v1 [math.AP], 2010, 39 pp., submitted.

[10] *Two weight estimate for the Hilbert transform and corona decomposition for non-doubling measures* (with F. Nazarov and A. Volberg), arXiv:1003.1596v1 [math.AP], 2010, 40pp.

[11] *Dyadic bi-parameter simple commutator and dyadic little BMO* (with I. Holmes and A. Volberg), arXiv:2012.05376 [math.FA], 2020, 14 pp.

[12] *Dyadic bi-parameter repeated commutator and dyadic product BMO* (with I. Holmes and A. Volberg), arXiv:2101.00763 [math.AP], 2020, 31 pp.

[13] *An inverse spectral problem for non-compact Hankel operators with simple spectrum* (with P. Gérard and A. Pushnitski), arXiv:2211.00965 [math.FA], 54 pp; submitted to Journal d'Analyse Mathématique.

[14] *A Dynamical System Approach to the Inverse Spectral Problem for Hankel Operators: A Model Case* (with Z. Liang), arXiv:2203.10650 [math.FA], 19 pp.

[15] *A Dynamical System Approach To The Inverse Spectral Problem For Hankel Operators: The General Case* (with Z. Liang), arXiv:2204.00115 [math.FA], 36 pp.

Selected conference talks

- Annual AMS meeting, Cincinnati, January 1994;
- AMS meeting, Manhattan, KS, March 1994;
- Informal Analysis Seminar at Kent State University, March 1994, plenary speaker;
- North Britain Functional Analysis Seminar, June 1994, plenary speaker;
- AMS meeting, Richmond, VA, November 1994;
- International workshop on operator theory and applications, Regensburg, Germany, Aug 95;
- Wabash miniconference on modern analysis, Indianapolis, IN, Sept 9–10, 1995;
- MSRI, program "Holomorphic spaces", Fall 1995, plenary speaker;
- International workshop on operator theory and applications (IWOTA), Bloomington, IN, summer 1996;
- International conference in honor of prof. Moshe Livsic, Beer–Sheva, Israel, July 1997;
- MSRI, workshop "Harmonic analysis and PDE", October 1997, plenary speaker;

- Great Plains Operator Theory Symposium (GPOTS), Manhattan, KS, May 1998, plenary speaker;
- Summer School in Analysis, Raglan, New Zealand, Jan. 1999.
- International conference in honor of Prof. Harry Dym 60th birthday, Rehovot, Israel, March 1999;
- Ervin Schrödinger Institute for Mathematical Physics, program in Harmonic Analysis, Vienna, June 1999.
- Summer school in harmonic analysis, Paseki, Chech Republic, May 2000. One of the four main lecturers.
- International workshop on operator theory and applications, Invited plenary speaker, Bordeaux, June 2000
- Conference "Harmonic Analysis and PDE", University of Missouri, Columbia, May 2002: invited plenary speaker.
- International Conference "Holomorphic spaces and their operators", Luminu, France, October 2002: invited plenary speaker.
- International Conference in Classical Analysis in Honor of Paul Koosis, Montreal, Canada, October 2003: invited plenary speaker.
- SEAM 2004, Tuscaloosa, AL, March 2004: invited plenary speaker.
- GPOTS 2004 (Great Planes Operator Theory Symposium), College Station, TX, May 2004: invited plenary speaker.
- Karl Stromberg Memorial Lecture, Kansas State University, Manhattan, KS, April 2005.
- Barcelona Analysis Conference (a satellite conference to ICM 2006), Sept. 2006, invited plenary speaker.
- Sixth Prairie Analysis Seminar, Lawrence, KS, Oct. 2006: main plenary speaker;
- Sixteens Summer Meeting on Mathematical Analysis, a satellite conference to Leonhard Euler Congress, St. Petersburg, Russia, June 25-30, 2007; invited plenary speaker.
- Banach Algebras 2007, July 4 to 12, 2007 at Université Laval, Québec City, Québec, Canada; invited plenary speaker.
- An Afternoon in Honor to Mischa Cotlar, October 2007, University of New Mexico, Albuquerque, NM: invited plenary speaker.
- Seventeenth Summer Meeting on Mathematical Analysis, a conference in honor of V. Khavin 75th anniversary, St. Petersburg, Russia, June 23-28, 2008; invited plenary speaker.
- 24th southeastern analysis meeting, Vanderbilt University, March 5-9, 2008, invited plenary speaker.
- Workshop on Recent Advances in Operator Theory and Function Theory, Fields Institute, Toronto, Canada, Jan 2008: invited plenary speaker.
- International conference "Modern Complex Analysis, Operator Theory and Applications", June 2009, El Escorial (Madrid), Spain; invited plenary speaker.
- International conference "Journees d'Analyse", September 27-29, 2010, Bordeaux, France; invited plenary speaker.
- Conference "Waves and Spectra", Jan 11-14th, 2011, Texas A&M University; invited main speaker.
- Eighth Advanced Course in Operator Theory and Complex Analysis, June 2011, Puerto de Santa Maria, Spain; main speaker.

- 20th Summer St. Petersburg Meeting in Mathematical Analysis, June 2011, St. Petersburg, Russia; invited plenary speaker.
- International workshop on operator theory and applications (IWOTA), July 2011, Seville, Spain; invited plenary speaker.
- International conference Modern Trends in Analysis in honor of Nikolai Nikolsky, August 31–September 2, 2011, Bordeaux, France; invited plenary speaker.
- Workshop on Corona Problem, June 18–22, 2012, Fields Institute, Toronto, Canada; organizer, plenary speaker.
- Workshop on Operator Theory, Complex Analysis, and Applications Instituto Superior Técnico, Lisbon, July 11-13, 2012; invited main speaker.
- Abel Symposium, August 21–24, 2012, Oslo, Norway; invited plenary speaker.
- CBMS Regional Conference in the Mathematical Sciences, Clemson University, August 12-16, 2013, invited speaker.
- Afternoon In Honor to Cora Sadosky, Albuquerque, New Mexico, April 2014, principal speaker (delivered a minicourse).
- CBMS Conference "Reflectionless measures, Wolff's potentials, and rectifiability", July 27–31 2015, invited plenary speaker.
- International conference "Everything is complex", Saas Fee, Switzerland, March 6–11, 2016: invited speaker.
- International conference "Probabilistic harmonic analysis and spectral theory", Instutut Mittag–Lefler, Stockholm, Sweeden, July 11–15, 2016: invited speaker.
- A minicourse in the semester program "Emergent trends of Complex Analysis and Functional Analysis" in the Mathematical Institute of Polish Academy of Sciences, Warsaw, Poland.
- 26th St. Petersburg Summer Meeting In Mathematical Analysis, June 25-30, 2017, St. Petersburg, Russia; invited plenary speaker.
- AIM program "Sparse domination of singular integral operators", Oct. 9-13, 2017, San Jose, CA
- Second Northeastern Analysis Meeting (NEAM 2017), Oct 13–15, 2017, Albany, NY; invited plenary speaker.
- International workshop "Spectral theory of Hankel operators and related topics", King's College, London, November 1–3, 2017; invited plenary speaker.
- 27th St. Petersburg Summer Meeting In Mathematical Analysis, August 6–11, 2018, St. Petersburg, Russia; invited plenary speaker.
- International Conference "Recent advances in functional analysis" dedicated to the memory of J. Diestel and V. Lomonosov, Oct 11–14, 2018, Kent, Ohio; invited plenary speaker.
- 2018 Texas Analysis and Mathematical Physics Symposium at Baylor University (October 26–28); invited plenary speaker.
- International conference "One-Dimensional Complex Analysis and Operator Theory", Euler International Mathematical Institute, St. Petersburg, Russia, May 13–17, 2019; invited plenary speaker.
- International conference "28th St.Petersburg Summer Meeting in Mathematical Analysis", Euler International Mathematical Institute, St. Petersburg, Russia, June 25–30, 2019; invited plenary speaker.
- International workshop "Emergent Trends in Complex Function Theory", Centre de Recerca Matemàtica, Barcelona, Spain, Oct. 28–31, 2019; Invited lecture.

- An intensive mini-course "Spectral theory, singular integral operators and harmonic analysis" at King's College, London, Feb. 2020.
- London Analysis Seminar, Feb. 2020.
- 29th St. Petersburg Summer Meeting in Mathematical Analysis, Sept. 28–30, 2020 (remotely), invited plenary speaker.
- Institute of Mathematics Polish Academy of Sciences (IMPAN), Banach center, Nov. 2020, (remotely)
- 29th St. Petersburg Summer Meeting in Mathematical Analysis, July 2021, invited plenary speaker.
- Fields Institute Colloquium, Nov. 2022.
- International Conference "Operators, Functions, Systems: Classical and Modern" in honor of N. Nikolskii 80th birthday; Mathematical Conference Center of the Polish Academy of Sciences, Bedlewo, Poland, June 12–18, 2022; invited plenary speaker.

Jan. 31, 2023